Writing an Effective Plain Language Summary

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ADVANCING EARTH AND SPACE SCIENCE

A Plain Language Summary (PLS) is a way to summarize a scientific study and its results in terms that are accessible to people outside of a specific scientific circle. The example below, taken from a review article published in *Reviews of Geophysics*, is broken down to show the four key elements that make an effective PLS and how the language from an Abstract can be modified for a Plain Language Summary.

Example from Climate Science

	ABSTRACT		PLAIN LANGUAGE SUMMARY
Topic overview	We assess evidence relevant to Earth's equilibrium climate sensitivity per doubling of atmospheric CO2, characterized by an effective sensitivity S. This evidence includes feedback process understanding, the historical climate record, and the paleoclimate record. An S value lower than 2 K is difficult to reconcile with any of the three lines of evidence. The amount of cooling during the Last Glacial Maximum provides strong evidence against values of S greater than 4.5 K. Other lines of evidence in combination also show that this is relatively unlikely.	**What does a non-expert reader need to know about the topic to understand your paper?** • Contextualizes area of study for readers with limited knowledge of the subject • Explains historical significance of study	→ Earth's global "climate sensitivity" is a fundamental quantitative measure of the susceptibility of Earth's climate to human influence. A landmark report in 1979 concluded that it probably lies between 1.5°C and 4.5°C per doubling of atmospheric carbon dioxide, assuming that other influences on climate remain unchanged. In the 40 years since, it has appeared difficult to reduce this uncertainty range.
Paper overview	We use a Bayesian approach to produce a probability density function (PDF) for S given all the evidence, including tests of robustness to difficult-to-quantify uncertainties and different priors.	**What did you set out to investigate?** • Provides brief explanation of what the authors examined	→ In this report we thoroughly assess all lines of evidence including some new developments.
Paper findings	The 66% range is 2.6–3.9 K for our Baseline calculation and remains within 2.3–4.5 K under the robustness tests; corresponding 5–95% ranges are 2.3–4.7 K, bounded by 2.0–5.7 K (although such high-confidence ranges should be regarded more cautiously). This indicates a stronger constraint on S than reported in past assessments, by lifting the low end of the range. This narrowing occurs because the three lines of evidence agree and are judged to be largely independent and because of greater confidence in understanding feedback processes and in combining evidence.	**What was the most significant result or conclusion in your paper?** • Provides brief summary of the paper's findings • Highlights one significant finding	→ We find that a large volume of consistent evidence now points to a more confident view of a climate sensitivity near the middle or upper part of this range. In particular, it now appears extremely unlikely that the climate sensitivity could be low enough to avoid substantial climate change (well in excess of 2°C warming) under a high-emission future scenario. We remain unable to rule out that the sensitivity could be above 4.5°C per doubling of carbon dioxide levels, although this is not likely.
Key takeaways	We identify promising avenues for further narrowing the range in S, in particular using comprehensive models and process understanding to address limitations in the traditional forcing-feedback paradigm for interpreting past changes.	**Why should a reader care about your findings?** • Identifies need for further investigation	→ Continued research is needed to further reduce the uncertainty, and we identify some of the more promising possibilities in this regard.

Sherwood, S. C., Webb, M. J., Annan, J. D., Armour, K. C., Forster, P. M., Hargreaves, J. C., et al. (2020). An assessment of Earth's climate sensitivity using multiple lines of evidence. *Reviews of Geophysics*, 58, e2019RG000678. https://doi.org/10.1029/2019RG000678

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